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PAPER

Patterns of unmet supportive needs and relationship to quality of life in Chinese cancer patients

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Abstract

Objective: This study aimed to (1) identify distinct patterns of unmet needs in Chinese cancer patients; (2) examine whether sociodemographic and medical characteristics distinguished these patterns; and (3) examine whether people with distinct patterns reported differential quality of life (QoL).

Methods: This cross-sectional study recruited 301 cancer patients from 2 hospitals in China. The 34-item Supportive Care Needs Survey Short-Form was used to measure unmet needs across 5 domains: physical and daily living, psychological, patient care and support, health systems and information, and sexuality. Latent class analysis was performed to identify patterns of unmet needs across these domains.

Results: Four patterns of unmet needs were identified, differing in levels and nature of unmet needs. Participants in class 1 (47%) reported few unmet needs. Patients in class 2 (15%) had moderate levels of unmet needs, displaying similar levels across 5 domains. People in class 3 (25%) and class 4 (13%) reported similarly high levels on "psychological," "health care system and information," "physical and daily living," and "patient care," but differing in "sexuality," with class 3 reporting low levels while class 4 high on "sexuality." None of sociodemographic and medical characteristics distinguished these patterns significantly. Compared to other classes, people in class 1 reported highest levels of QoL.

Conclusions: This study demonstrates the existence of 4 patterns of unmet supportive needs in Chinese cancer patients. Patients with few unmet needs reported the best QoL.

KEYWORDS

cancer, Chinese patients with cancer, oncology, patterns of unmet needs, quality of life

1 | INTRODUCTION

Supportive care for cancer refers to offering essential medical and/or psychological services to satisfy cancer patients' supportive care needs (eg, physical, social, and psychological) throughout disease.[1] A high quality of supportive care may help people to better cope with cancer from diagnosis until posttreatment.[2] However, most cancer patients' supportive needs are not well satisfied in information provision,[3-6] psychosocial support,[4,7] practical assistance,[8,9] and sexual issues.[7,10] For Chinese cancer population, existing studies in Hong Kong[11-15] and Taiwan[16,17] found that the most common unmet needs were about health systems and information.

Most studies examining cancer patients' unmet needs applied "a variable-centered approach" and mainly examined prevalence and levels of unmet needs. For example, a recent cross-sectional study in Malaysian breast cancer patients found that the most prevalent types of unmet needs were uncertainty about future, fears about cancer spreading, and sadness.[18] Yet such an approach focusing on prevalence of unmet needs at the group level could be misleading, making it difficult to consider individual differences on unmet needs.[19] For example, a low-frequency unmet need could be highly salient and clinically relevant for people who are experiencing that need.[19]

Lei Zhu and Juntao Yao share the first coauthorship.

Thus, there is a need to apply "an individual-centered approach" to identify distinct patterns of unmet needs. Such an examination could provide clinically relevant suggestions into the design of higher quality supportive care. Up till now, few research was done to examine patterns of unmet needs in cancer patients. The only study applying an individual-centered approach focused on cancer patients' unmet informational needs and found 5 patterns: 4 patterns displaying moderate to high levels of unmet needs and one showing low levels.[20] But it remains unclear whether distinct patterns exist across other domains of unmet needs.

Provided that distinct patterns of unmet needs can be identified, it is important to examine which factors distinguish these patterns. In terms of sociodemographic and medical variables, studies have found that higher levels of unmet needs were related to age,[14,21] marital status[22], educational level,[10] cancer type,[22] and stage of cancer.[23] Moreover, age could distinguish cancer patients with distinct patterns of unmet informational needs: Those with patterns showing higher levels tended to be younger.[20] These findings suggest that unmet needs are influenced by environmental factors, but whether these factors relate to patterns of unmet needs remains unclear.

With regard to relations between unmet needs and quality of life (QoL), studies found that high unmet needs were related to lower QoL.[11,13,24] Therefore, it could be expected that cancer patients with differential patterns of unmet needs would report differential QoL. For example, a pattern with higher levels of unmet needs would display lower QoL, while a pattern with lower levels unmet needs may have higher QoL.

To fill in the knowledge gap, this study applied an individual-centered approach (ie, latent class analysis [LCA]) and firstly aimed to identify distinct patterns of unmet needs among heterogeneous types of cancer patients in China. Currently in China, only limited number of hospitals offer supportive care services for cancer patients (eg, distress screening).[25,26] Examining Chinese cancer patients' patterns of unmet needs may offer relevant suggestions to the development of supportive care services in China. We hypothesized that distinct patterns of unmet needs can be identified, though we did not have specific hypothesis regarding possible patterns. The second aim was to examine whether sociodemographic and medical variables could distinguish patients with distinct patterns. On the basis of previous findings, we hypothesized that age would distinguish patients with distinct patterns of unmet needs. The third aim was to examine relationships between patterns of unmet needs and QoL. We hypothesized that patients with patterns showing high unmet needs would report lower QoL.

2 | METHOD

2.1 | Sample and procedure

Shaanxi Provincial Tumor Hospital and Department of oncology at Xijing Hospital affiliated Medical University of the Air Force in Xi'an, China, were involved in participants recruiting between May and December, 2016. People who were receiving cancer-related medical treatment at 2 hospitals were informed of the research. The inclusion criteria were (1) diagnosed with cancer, (2) >18 years, and (3) able to complete Chinese questionnaire. This study was approved by the Ethical Committee of Shaanxi Provincial Tumor Hospital (reference 2016-3).

Cancer patients who agreed to participate and signed the informed consent form were asked to complete a self-report questionnaire. A total of 360 patients were approached, and 330 patients agreed to participate. The 30 people who declined did not differ significantly in sociodemographic variables from those 330 people ($Ps > .05$). Of the 330 people, 29 were excluded because of the incomplete questionnaire and 301 were included.

2.2 | Measures

2.2.1 | Sociodemographic and medical characteristics

Sociodemographic (eg, age, gender, and educational level) and medical characteristics (eg, cancer type, metastases, and cancer stage) were obtained through self-report questionnaires.

2.2.2 | Unmet supportive care needs

Unmet supportive care needs were measured by the 34-item Supportive Care Needs Survey Short-Form (SCNS-SF34).[27,28] This scale measures cancer patients' levels of unmet needs across 5 domains: physical and daily living, psychological, patient care and support, health systems and information, and sexuality. Each item was answered on a 5-point Likert scale ranging from 1 to 5 (1 = *no need, not applicable*; 2 = *no need, satisfied*; 3 = *low need*; 4 = *moderate need*; and 5 = *high need*). A standardized Likert scale was calculated for each domain, with a possible 0 to 100 range. High scores indicated higher unmet needs. A traditional Chinese SCNS-SF34 was validated in Hong Kong cancer patients and demonstrated good internal reliability and construct validity.[29] After transforming the traditional Chinese SCNS-SF34 into simplified Chinese, 2 oncologists were invited to check the content and the face validity. Additionally, 25 cancer patients completed the questionnaire and reported that the scale was easy to understand. We found a Cronbach α of 0.95.

2.2.3 | Quality of life

Quality of life was measured by European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ-C30).[30] The EORTC-QLQ-C30 covers 9 multi-item subscales: 5 functional scales (physical, role, cognitive, emotional, and social); 3 symptom scales (fatigue, pain, and nausea/vomiting); and a global QoL scale. The EORTC-QLQ-C30 includes 6 single-item scales: dyspnoea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties. Each item was answered on a 4-point Likert scale from 1 (*not at all*) to 4 (*very much*). Scale scores were calculated by averaging items within scales and transforming average scores linearly, with scale scores ranging from 0 to 100. For functional scales, higher scores indicated higher functioning. For symptoms scales, higher scores represented severe problems. The Chinese EORTC-QLQ-C30 has been validated and shown good validity and reliability in Chinese cancer population.[31] We found Cronbach αs ranged from 0.78 to 0.89.

2.3 | Data analyses

Latent class analysis was used to identify distinct patterns of unmet needs on 5 domains[32] of SCNS-SF34 in M*plus* 7.3. All participants fully completed the SCNS-SF34.

We tested LCA models ranging from 2 to 5 classes. We used several statistical and nonstatistical criteria to determine the best-fitting model. The statistical criteria included Bayesian information criterion (BIC), Akaike information criterion (AIC), entropy, bootstrapped likelihood ratio test (BLRT), and Vuong-Lo-Mendell-Rubin likelihood ratio (VLMR) test. The BIC and AIC are measures of relative fit of distinct models, with lower values showing better fitting. Entropy is to inspect the latent class separation, with higher values (>0.6) indicating better class separation.[33] The BLRT and VLMR are to examine whether the "K-class-model" is better than the "K-1-class-model." Significant BLRT and VLMR show that the K-class-model is better.[33,34] After the statistical selection, we turned to nonstatistical criteria. When deciding the number of classes, the addition of one extra class should be conceptually meaningful and represent a pattern that obviously differs from other patterns in the model with fewer classes.[33] According to latent class posterior distribution of the best-fitting model, each participant was given the most likely class membership, which was exported to SPSS 22.0 to represent patterns of unmet needs for each participant.

To examine whether sociodemographic and medical characteristics could distinguish participants with different patterns of unmet needs, chi-square tests and ANOVAs were performed on each variable.

To test the relationships between patterns of unmet needs and QoL, ANOVAs were conducted.

3 | RESULTS

3.1 | Participants' characteristics

Table 1 presents sociodemographic and medical characteristics of participants of the 301 participants (consent rate: 301/360 = 84%). The mean age was 50.07, 60.4% were female, half had middle-leveled education, and majority were married. Lung, breast, and gynecological cancer were the most common.

3.2 | Identifying distinct patterns of unmet needs in cancer patients

As shown in Table 2, the 5-class model had the lowest BIC and AIC and a significant BLRT, suggesting that this model was the best. However, the smallest class of the 5-class model (4%) did not contain a substantial number of people. We therefore rejected this model and compared the 4- and 3-class models: BIC, AIC, entropy, and BLRT all favored the 4-class model. The smallest group of the 4-class model had a substantial number of people (13%). Thus, the 4-class model was selected.

Figure 1 shows mean levels of domains of unmet needs at each latent class. Participants in class 1 (n = 139, 47%) reported the lowest levels of unmet needs across all 5 domains, with elevated scores on "health care system and information" and "patient care." Patients in class 2 (n = 45, 15%) had moderate levels of unmet needs, which displayed similar levels across all 5 domains of unmet needs. People in class 3 (n = 76, 25%) and class 4 (n = 38, 13%) reported similarly high levels of unmet needs on "psychological," "health care system and information," "physical and daily living," and "patient care" domains, but differing in "sexuality," with people in class 3 reporting low sexuality needs, whereas class 4 high sexuality needs.

3.3 | Predictors of distinct patterns of unmet needs

None of sociodemographic and medical factors significantly distinguished between patterns of unmet needs (Table 1).

3.4 | Patterns of unmet needs: relationships with QoL

Distinct patterns of unmet needs were significantly related to areas of QoL (Table 1). Compared to patients in classes 2, 3, and 4, people in class 1, with the lowest levels of unmet needs reported significantly higher global health ($P < .001$) and functioning (physical, role, emotional, cognitive, and social functioning, $Ps < .001$) as well as fewer physical symptoms (fatigue, pain, insomnia, and appetite loss, $Ps < .001$; nausea and diarrhea, $Ps < .01$; dyspnea and constipation, $Ps < .05$). Patients in class 1 reported fewer financial difficulties than those of classes 3 and 4 ($Ps < .01$).

4 | DISCUSSION

This study focused on cancer patients in China and aimed to identify distinct patterns of unmet needs and to examine their predictors and relationships to QoL. The LCA identified 4 patterns of unmet needs differing in levels and nature of unmet needs: Class 1 (47%), with few unmet needs, reported the lowest levels of unmet needs; class 2 (15%), with higher levels than people in class 1, displayed moderate levels across 5 domains of unmet needs; class 3 (25%) and class 4 (13%) reported similarly high levels of unmet needs on 4 domains of unmet needs ("psychological," "health care system and information," "physical and daily living," and "patient care") but differing on "sexuality," with class 4 showing notably high levels of unmet sexuality needs. Sociodemographic and medical characteristics could not distinguish these patterns. Patients with distinct patterns reported differential levels of QoL.

The 4 patterns of unmet needs differed in levels of unmet needs. Almost half of our sample (classes 2, 3, and 4) encountered evident unmet needs, whereas the remaining half (class 1) did not. This is consistent with the study of Neumann et al that used LCA examining cancer patients' patterns of informational needs.[20] This cross-sectional study recruited 326 adults with heterogeneous types of cancer in Germany and found 5 patterns of informational needs, whereby 4 patterns with moderate to high levels of unmet informational needs and 1 pattern with low levels. Our findings add to literature about patients' prevalence and levels of unmet needs and clearly suggest that patients may experience differential patterns on other domains of unmet needs, in addition to informational needs. Particularly, our findings revealed a meaningful proportion of patients (classes 3 and 4) with high unmet needs. The Neumann et al study found that patients with high unmet informational needs were reluctant to express their needs.[20] Yet, with

TABLE 1 Sociodemographic and medical characteristics and quality of life of total sample and of 4 latent classes (n = 301)

	Total Sample	Class 1	Class 2	Class 3	Class 4	ANOVA[a]/χ^2
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	*F* value
Age	50.07 (13.09)	49.26 (14.38)	50.54 (10.06)	51.80 (13.13)	49.00 (10.84)	0.71
Months since diagnosis	14.25 (16.44)	14.56 (15.50)	12.14 (17.84)	13.37 (13.76)	17.43 (22.43)	0.75
Quality of life						
Global health	57.91 (23.88)	65.64 (22.57)	55.98 (20.59)	44.05 (21.48)	59.05 (24.62)	14.36*** 3 < 1,2,4
Functioning						
Physical functioning	74.13 (21.49)	82.13 (16.08)	69.84 (16.54)	64.61 (25.19)	68.51 (25.33)	14.58*** 1 > 2,3,4
Role functioning	73.67 (27.87)	83.93 (20.30)	69.38 (23.55)	58.33 (33.72)	71.62 (28.56)	16.66*** 1 > 2,3
Emotional functioning	73.62 (22.65)	84.19 (16.70)	66.67 (21.67)	64.00 (23.34)	61.49 (24.63)	24.09*** 1 > 2,3,4
Cognitive functioning	77.89 (22.43)	85.25 (18.72)	72.48 (20.86)	70.89 (24.83)	70.72 (24.03)	10.44*** 1 > 2,3,4
Social functioning	63.25 (28.59)	75.42 (23.17)	59.52 (25.00)	51.11 (30.18)	46.39 (28.36)	20.99*** 1 > 2,3,4
Fatigue	23.63 (33.63)	23.34 (19.39)	40.31 (16.27)	45.83 (25.59)	39.48 (22.18)	21.82*** 1 < 2,3,4
Nausea	15.87 (15.87)	10.31 (18.54)	21.70 (28.29)	18.89 (25.75)	23.87 (25.31)	5.56*** 1 < 2,4
Pain	21.69 (26.35)	10.91 (17.80)	25.58 (24.76)	36.07 (32.75)	29.28 (24.34)	19.44*** 1 < 2,3,4
Dyspnea	15.80 (23.89)	11.84 (21.24)	17.46 (21.13)	17.59 (26.81)	25.22 (27.67)	3.47* 1 < 4
Insomnia	25.59 (29.34)	16.31 (23.86)	31.00 (30.33)	34.68 (32.84)	36.04 (29.79)	9.89*** 1 < 2,3,4
Appetite loss	28.18 (28.18)	18.49 (22.11)	29.27 (22.60)	39.04 (33.73)	40.54 (30.57)	12.78*** 1 < 3,4
Constipation	19.29 (25.42)	14.39 (21.63)	23.81 (25.80)	23.42 (27.99)	24.32 (30.07)	3.38*
Diarrhea	10.66 (20.42)	6.95 (15.27)	10.85 (20.21)	12.00 (21.67)	21.62 (29.62)	5.42** 1 < 4
Financial problems	50.23 (36.92)	42.93 (36.39)	47.15 (31.60)	59.56 (38.87)	62.16 (34.39)	4.99** 1 < 3,4
	%	%	%	%	%	χ^2
Gender						
Male	39.6%	38.1%	37.8%	43.4%	39.5%	0.65
Female	60.4%	61.9%	62.2%	56.6%	60.5%	
Marital status						
Single	7.8%	10.9%	2.2%	6.8%	5.4%	7.32
Married	89.1%	85.5%	95.6%	89.0%	94.6%	
Divorced	1.7%	1.4%	2.2%	2.7%	0.0%	
Widowed	1.4%	2.2%	0.0%	1.4%	0.0%	
Educational Level[b]						
Low	27.8%	24.3%	26.7%	30.0%	37.8%	4.14
Middle	56.9%	61.0%	57.8%	55.7%	43.2%	
High	15.3%	14.7%	15.6%	14.3%	18.9%	
Cancer type						
Breast	22.3%	19.4%	32.6%	23.0%	19.4%	
Lung	16.7%	17.2%	18.6%	17.6%	11.1%	
Gastric	10.5%	13.4%	7.0%	8.1%	8.3%	
Gynecological	16.7%	17.2%	14.0%	17.6%	16.7%	
Colorectal	4.5%	4.5%	2.3%	1.4%	13.9%	
Pancreas	2.8%	2.2%	2.3%	2.7%	5.6%	
Liver	2.1%	1.5%	2.3%	4.1%	0.0%	
Lymphoma	4.9%	3.0%	11.6%	4.1%	5.6%	
Multiple malignant	3.1%	3.0%	2.3%	2.7%	5.6%	
Others[c]	16.4%	18.7%	7.0%	18.9%	13.9%	
Recurrence						
Yes	28.4%	22.7%	27.9%	35.7%	35.3%	4.72
No	71.6%	77.3%	72.1%	64.3%	64.7%	
Cancer stage						
Stage I	18.9%	18.8%	24.4%	13.5%	24.3%	
Stage II	28.4%	28.6%	29.3%	28.4%	27.0%	
Stage III	21.1%	21.1%	26.8%	14.9%	27.0%	

(Continues)

TABLE 1 (Continued)

	Total Sample	Class 1	Class 2	Class 3	Class 4	ANOVA[a]/χ^2
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	*F* value
Stage IV	31.6%	31.6%	19.5%	43.2%	21.6%	
Type of medical treatment						
Chemotherapy	65.1%	63.2%	77.5%	68.9%	50.0%	23.46
Surgery	21.8%	20.5%	12.5%	21.3%	38.2%	
Radiation	6.3%	8.5%	2.5%	6.6%	2.9%	
Chinese medicine treatment	4.0%	6.0%	2.5%	0.0%	5.9%	
Chemotherapy + surgery + radiation	1.6%	0.9%	0.0%	3.3%	2.9%	
Others	1.2%	0.9%	5.0%	0.0%	0.0%	

*P < .05.

**P < .01.

***P < .001.

[a]Bonferroni post hoc pairwise comparisons (α = 0.05).

[b]Low education = elementary school, middle education = middle or high school, high education = college/university or above.

[c]Others include blood, brain, and skin tumor.

TABLE 2 Fit indices and class prevalence for the LCA

	BIC	AIC	Entropy	BLRT	VLMR	Prevalence				
						Class 1	Class 2	Class 3	Class 4	Class 5
2-class LCA model	12 200.17	12 141.01	0.81	−6277.00***	−6277.00***	62%	38%			
3-class LCA model	12 133.04	12 051.71	0.79	−6054.51***	−6054.51***	32%	39%	29%		
4-class LCA model	12 066.09	11 962.57	0.85	−6003.85***	−6003.85[n.s.]	15%	47%	26%	13%	
5-class LCA model	12 052.60	11 926.60	0.83	−5953.29***	−5953.29[n.s.]	33%	15%	13%	33%	6%

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; BLRT, bootstrapped likelihood ratio test; LCA, latent class analysis; VLMR, Vuong-Lo-Mendell-Rubin likelihood ratio.

***P < .001.

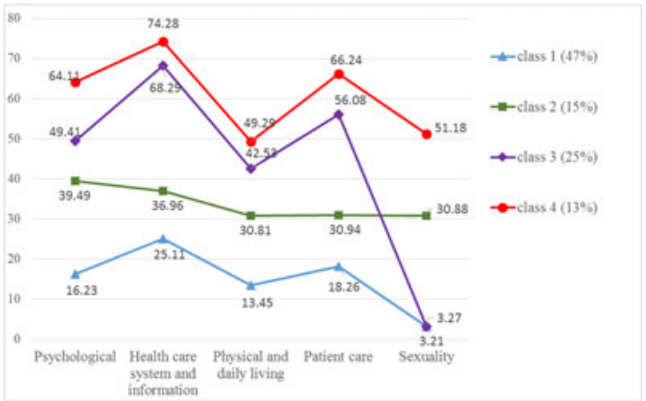

FIGURE 1 The levels of unmet needs at the whole sample and the 4 latent classes

our research design, it remains unclear whether our participants with high unmet needs are reluctant to express their concerns or whether they have expressed these but cannot be satisfied by the current services. Future research is needed to examine this issue in Chinese cancer population.

The 4 patterns of unmet needs differed in nature of unmet needs. Specifically, sexuality needs played an important role in distinguishing the 4 patterns. Sexuality was the least-common unmet need compared with the other 4 needs. This accords with previous reviews examining prevalence of unmet needs in cancer patients.[1,19] A systematic review found that 7.4% of cancer population reported unmet sexuality needs, whereas 12.8% to 33.3% reported other types of unmet needs.[19] Our findings showed that although unmet sexuality need was generally low frequent, it could be highly salient for a small amount of people even during the receipt of medical treatment. For them, sexual concern needs to be addressed as well.

Moreover, unmet health system and information needs (eg, information about helping oneself get well) were the most persistent unmet needs across 4 patterns of unmet needs. This corroborates findings in Chinese cancer patients of Hong Kong and Taiwan[12-14,16] and breast cancer patients in Mexico,[6] but different from findings in western countries whereby psychological needs were the most common.[35-37] These findings firstly implies that Chinese cancer population may perceive more cancer-related informational needs and fewer psychological needs than patients in western countries. Future cross-cultural studies are needed to examine this and investigate possible reasons. Second, our findings indicate that the current health system for

Chinese cancer population may be insufficient to satisfy patients' supportive care needs. Especially in mainland China, supportive care services for cancer patients are not well established yet, with only a small number of hospitals offering supportive care services.[25,26] Our study clearly emphasizes the importance of incorporating supportive care services into routine cancer care in hospitals, although it could be challenging because of the lack of guidelines and training about supportive care in China. Particularly, our findings suggest that offering more information about cancer and cancer-related care (eg, things helping oneself well and cancer control) can be an important first step.

As for the predictors, none of the sociodemographic and medical characteristics distinguished participants with distinct patterns of unmet needs. The Neumann study found that age was the only variable that distinguished 4 patterns of unmet informational needs.[20] People showing patterns with higher unmet informational needs were younger. It should be noted that the Neumann study has a sample with mean age of 58.7 (65% above 50 years), whereas our sample was relatively younger with mean age of 50.07 (52% above 50 years). The relatively smaller portion of older people might be the reason why we did not find age as a predictor of unmet needs patterns. Considering the relatively small sample of this study, future studies with larger sample sizes are needed to reach a stronger conclusion about the role of sociodemographic and medical characteristics. Moreover, future studies should focus on other psychosocial variables (eg, clinician-patient relationship and family support) and examine whether these variables could distinguish patterns of unmet needs.

Cancer patients in class 1 (with lower levels of unmet needs) reported differential levels of QoL compared to patients in the other 3 classes, with patients in class 1(with few unmet needs) reporting higher levels of QoL. This finding corroborates previous studies and extends literature on cancer patients' unmet needs by highlighting the importance of identifying and satisfying unmet needs for cancer patients' QoL. More importantly, we found that the 2 classes with high unmet needs (classes 3 and 4) did not differ on QoL, despite that the 2 classes mainly differing on sexuality needs. The nonsignificant findings could be due to the relatively small sample size of class 4, which might have reduced the power to find significant relationships. Future research with a larger sample size is needed to further examine this issue. Moreover, future studies should examine whether patterns of unmet sexuality needs relate to sexual-related QoL.

4.1 | Clinical implications

A better understanding about individual differences in unmet needs may help to tailor psycho-oncological interventions. Particularly, 2 subgroups of cancer patients showing high unmet needs and low QoL (classes 3 and 4) were identified in this study. Unmet sexuality needs were important in distinguishing these 2 subgroups, of which one group reporting high unmet sexuality needs (class 4), whereas the other group did not (class 3). This finding suggests that the provision and design of psychological intervention should take into account individual's sexuality needs.

4.2 | Study limitations

Several limitations should be considered. First, the use of a cross-sectional design made it difficult to draw causal relationships between patterns of unmet needs and predictors and QoL. Future longitudinal studies are needed to examine this issue. Second, the sample size of this study was relatively small, which might have reduced the power to find relevant predictors of patterns of unmet needs. Third, this study included cancer patients undergoing medical treatment in hospitals in China. Thus, our findings may not be generalized to cancer survivors who have completed medical treatment.

5 | CONCLUSIONS

Despite these limitations, this study is the first to use an individual-centered approach to identify distinct patterns across various domains of unmet needs in Chinese cancer patients. The use of an advanced analytic method added to the research on prevalence and levels of cancer patients' unmet needs, and provided a more detailed description regarding how patients' unmet needs vary from each other. Particularly, our findings revealed a substantial number of cancer patients with high levels of unmet needs and low levels of QoL. Clinicians should be aware of the complexity and heterogeneity of cancer patients' unmet needs. Moreover, our findings highlight the importance of incorporating supportive care into the routine cancer care in China.

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CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

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